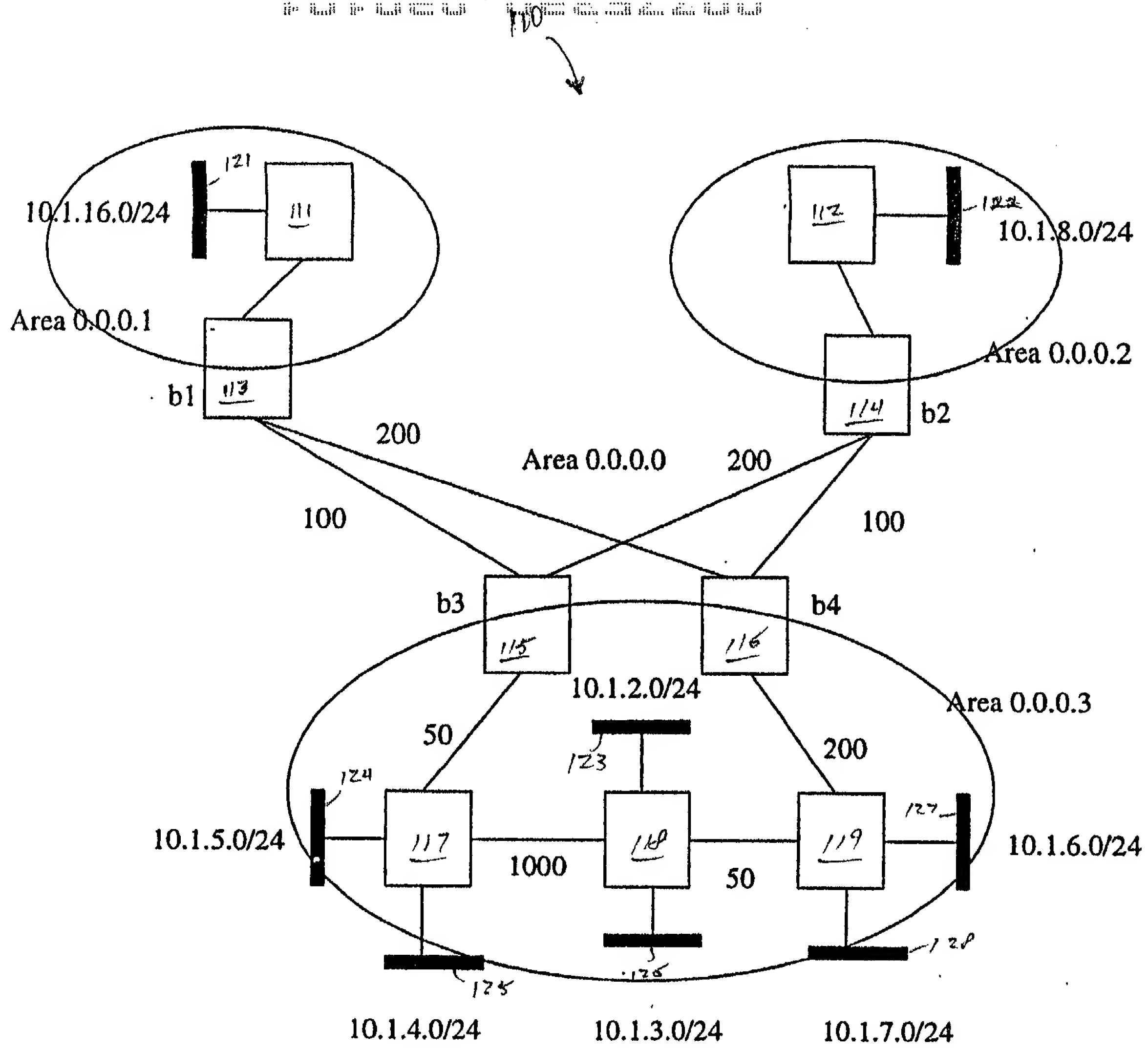

100
10.1.16.0/24
121
111
Area 0.0.0.1
b1
113
112
122
10.1.8.0/24
Area 0.0.0.2
114
b2
200
100
Area 0.0.0.0
200
100
b3
115
b4
116
10.1.2.0/24
Area 0.0.0.3
50
123
200
124
10.1.5.0/24
117
1000
118
50
119
127
10.1.6.0/24
125
126
128
10.1.4.0/24
10.1.3.0/24
10.1.7.0/24

FIGURE 1

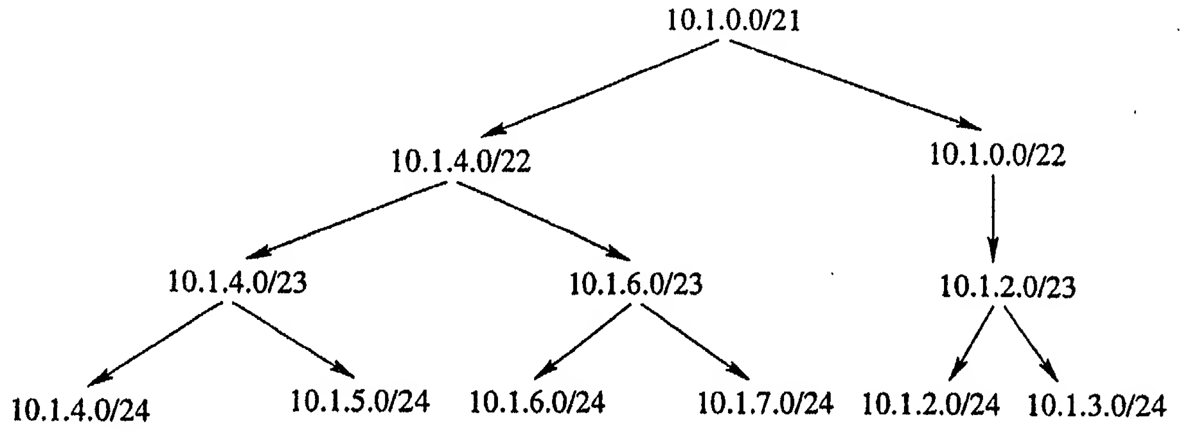

10.1.0.0/21
10.1.4.0/22
10.1.0.0/22
10.1.4.0/23
10.1.6.0/23
10.1.2.0/23
10.1.4.0/24
10.1.5.0/24
10.1.6.0/24
10.1.7.0/24
10.1.2.0/24
10.1.3.0/24

FIGURE 2

```
procedure ComputeMinError(Aggregate $x$, Aggregate $y$, integer $l$)
if subTree[$x$, $y$, $l$].computed = true
   return [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates]
minError := minError1 := minError2 := $\infty$
if $x$ is a leaf {
   minError1 := $\sum_{s \in S} D(s,t) * (lsp(s,x,\{y\},W_A) - lsp(s,x))$
   if $l > 0$
      minError2 := $\sum_{s \in S} D(s,t) * (lsp(s,x,\{x\},W_A) - lsp(s,x))$
   if minError1 $\leq$ minError2
      [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates] := [minError1, $\emptyset$]
   else
      [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates] := [minError2, $\{x\}$]
}
if $x$ has a single child $u$ {
   [minError1, aggregates1] := ComputeMinError($u$, $y$, $l$)
   if $l > 0$
      [minError2, aggregates2] := ComputeMinError($u$, $x$, $l - 1$)
   if minError1 $\leq$ minError2
      [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates] := [minError1, aggregates1]
   else
      [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates] := [minError2, aggregates2 $\cup$ $\{x\}$]
}
if $x$ has children $u$ and $v$ {
   for $i := 0$ to $l$ {
      [minError1, aggregates1] := ComputeMinError($u$, $y$, $i$)
      [minError2, aggregates2] := ComputeMinError($v$, $y$, $k - i$)
      if minError1 + minError2 < minError
         minError := minError1 + minError2
         aggregates := aggregates1 $\cup$ aggregates2
   }
   for $i := 0$ to $l - 1$ {
      [minError1, aggregates1] := ComputeMinError($u$, $x$, $i$)
      [minError2, aggregates2] := ComputeMinError($v$, $x$, $k - i - 1$)
      if minError1 + minError2 < minError
         minError := minError1 + minError2
         aggregates := aggregates1 $\cup$ aggregates2 $\cup \{x\}$
   }
   [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates] := [minError, aggregates]
}
subTree[$x$, $y$, $l$].computed := true
return [subTree[$x$, $y$, $l$].error, subTree[$x$, $y$, $l$].aggregates]
```

FIGURE 3

```
procedure CombineMinError()
for $i = 1$ to $m$
    for $j = 0$ to $k$ {
        $T_i[j]$.[error, aggregates] := ComputeMinError(r($T_i$), $\epsilon$, $j$)
        $X_i[j]$.[error, aggregates] := [$\infty$, $\emptyset$]
    }
for $j = 0$ to $k$
    $X_1[j]$.[error, aggregates] := $T_1[j]$.[error, aggregates]
for $i = 1$ to $m$
    for $j = 0$ to $k$
        for $l = 0$ to $j$
            if ($X_{i-1}[l]$.error + $T_i[j-l]$.error < $X_i[j]$.error) {
                $X_i[j]$.error = $X_{i-1}[l]$.error + $T_i[j-l]$.error
                $X_i[j]$.aggregates = $X_{i-1}[l]$.aggregates $\cup$ $T_i[j-l]$.aggregates
            }
```

FIGURE 4

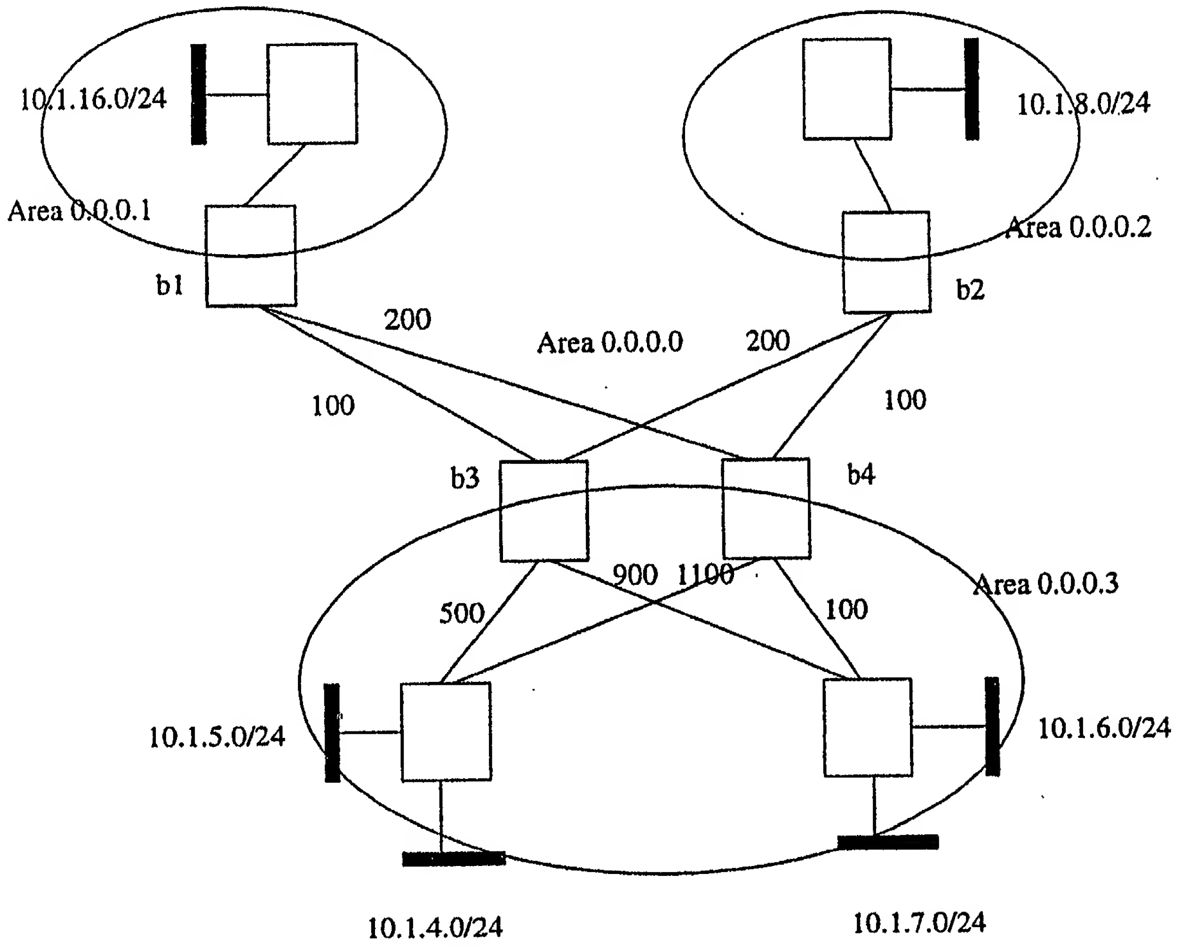

10.1.16.0/24
10.1.8.0/24
Area 0.0.0.1
Area 0.0.0.2
b1
b2
200
Area 0.0.0.0
200
100
100
b3
b4
900
1100
500
100
Area 0.0.0.3
10.1.5.0/24
10.1.6.0/24
10.1.4.0/24
10.1.7.0/24

FIGURE 5

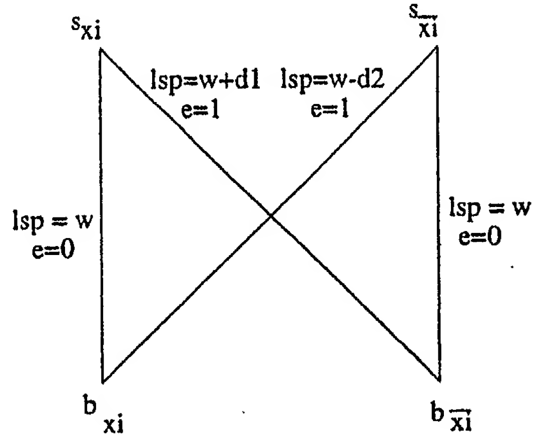
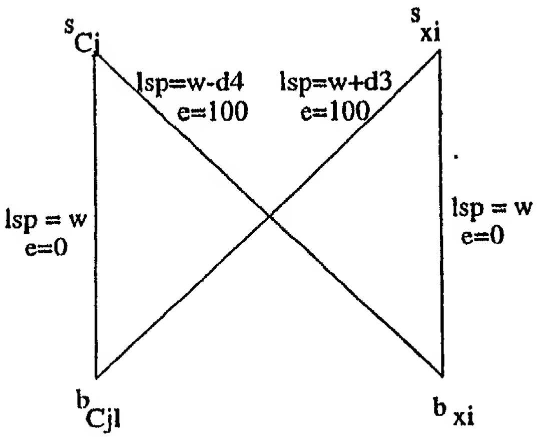
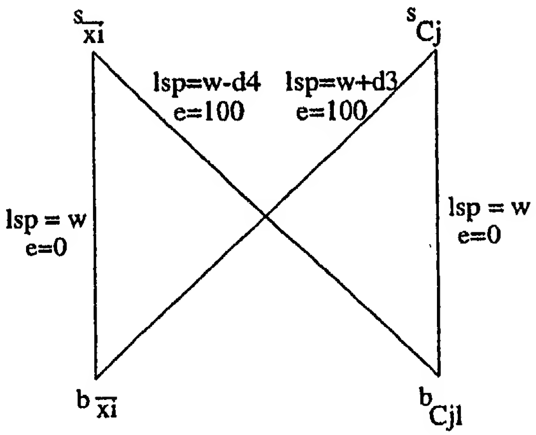


FIGURE 6



(a) $C_{jl} = x_i$

FIGURE 7A



(b) $C_{jl} = \bar{x}_i$

FIGURE 7B

```
procedure ComputeWeightsCumulative()
for each $b \in B_i$ set $W_{min}(b) := 0$
for $i := 1$ to $r$ {
    $W := W_{min}$
    Choose a random subset $R \subseteq B_i$ of ABRs
    for each $b \in R$ set $W(b)$ to a random weight in $[0, L]$
    if $\sum_{s \in S} e(s, B(s, W)) < \sum_{s \in S} e(s, B(s, W_{min}))$
        $W_{min} := W$
}
return $W_{min}$
```

FIGURE 8

```
procedure ComputeWeightsMax(Q)
    1. for each b ∈ $B_i$ set Wold(b) := 0
    2. while (P$b_2$B

i Wold(b) ≤ (

j $B_i$ j*(j $B_i$ j-1)

2 ) *lspmax) f3. Let

Q0 be a new set of inequalities that result when the value Wold(b) is
substituted for each variable W (b)only on the LHS of each inequality
in Q 4. Set Wnew(b) to the smallest possible value such that each
inequality in Q0 is satisfied when Wnew(b) is substituted for variable
W (b) in Q0 5. if Wnew = Wold 6. return Wnew 7. else 8. Wold := Wnew 9.
g 10. return "there does not exist a weight assignment W "
```

FIGURE 9

```
procedure ComputeWeightsTwoABR()
Set $V_{opt} := v(s_1)$, $E := E_{opt} := \sum_{s \in S} e(s, b_1)$
for $j := 1$ to $n$ {
    $E := E + e(s_j, b_2) - e(s_j, b_1)$
    if $E < E_{opt}$
        $V_{opt} := v(s_{j+1})$, $E_{opt} := E$
}
return $V_{opt}$
```

FIGURE 10